OPTI-UPS®
Protect and Serve

OPTI-Solar

Solar off-grid Inverter

SP Junior Series

User Manual

Contents

1 PREFACE 3
1.1 Glossary 3
2 INTRODUCTION 3
2.1 Description 3
2.2 Features 3
2.3 Appearance 3
3 INSTALLATION 4
3.1 Safety 4
3.1.1 Positioning 4
3.1.2 Appliances connected 4
3.2 Connections 5
4 OPERATION 5
4.1 Turning ON power 5
4.2 Charging the battery 6
5 STATUS MONITORING 7
5.1 Alarms 7
6 APPENDIX 8
6.1 Inverter Specifications 8
6.2 Solar Charger Controller Specifications 9
6.3 Mechanical Specifications 9

1 PREFACE

1.1 Glossary

AC: Alternating Current
DC: Direct Current
LCD: Liquid Crystal Display
LED: Light Emitting Diode
PC: Personal Computer
PV: Photovoltaic

2 INTRODUCTION

2.1 Description

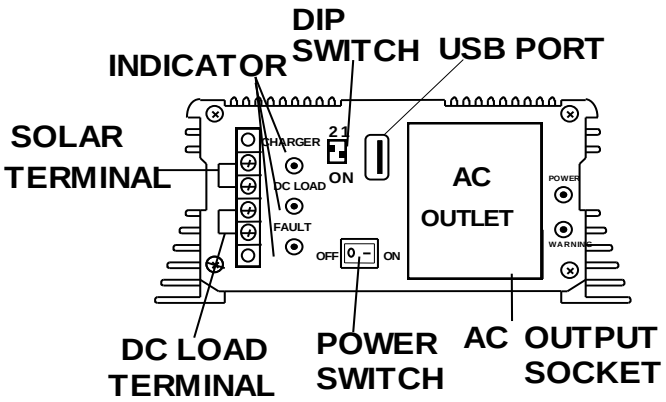
The Solar SP Junior series inverters are designed to have access to PV panel DC power source and provide dual output – DC and AC.
These mini-inverters combined with PV solar modules convert sun light into modified sine wave AC output power as well as DC output power for various types of electric loads, as well as offer selectable multistage battery charging current for selectable various battery types.

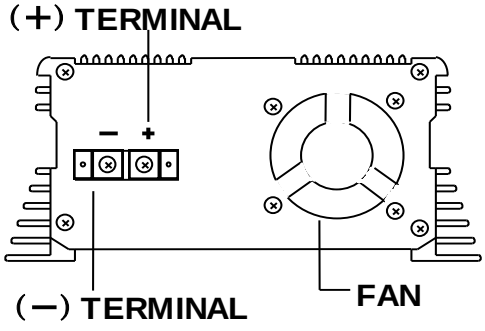
The built-in 3-stage intelligent charger automatically charges Ni-Cad, GLE/AGM, flooded, sealed/wet batteries without the risk of overcharge. The compact and modular design makes utility interactive installations easier and more cost effective. It is a high quality product that offers the best price-performance ratio in the industry.

2.2 Features

1. Smallest form-factor
2. Inverter and solar charger controller all-in-one design
3. Output for AC and DC load
4. 12Vdc and 24Vdc modes available with correct/wrong battery capacity auto-detection
5. Output short circuit protection
6. Battery Low, Battery Depleted, Overheating alarms
7. 3-step battery charging
8. Ni-Cad, GLE/AGM, flooded, sealed/wet battery types supported
9. High efficiency

2.3 Appearance





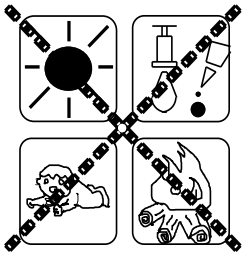
3 INSTALLATION

3.1 Safety

3.1.1 Positioning

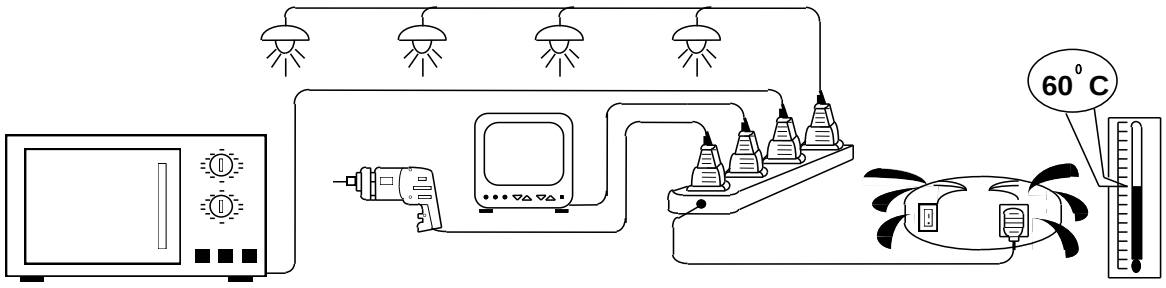
Always place the inverter in an environment which is:

1. Well ventilated;
2. Not exposed to direct sunlight or heat;
3. Out of reach of children;
4. Away from water/moisture, oil or grease;
5. Away from any flammable substances.

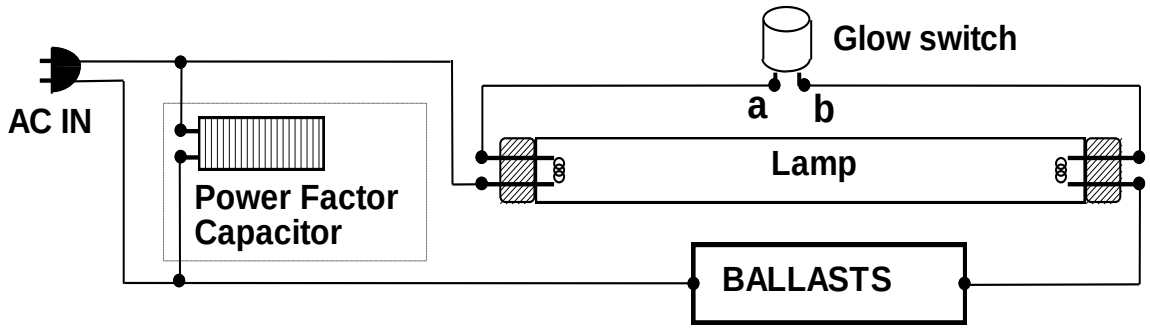


3.1.2 Appliances connected

If the total power (in watts) of electrical appliances connected, exceeds the output capacity of the inverter, or after operating for a period of time the temperature of the inverter reaches 60˚C, the inverter shall cut off AC output following the command from the protection circuit.

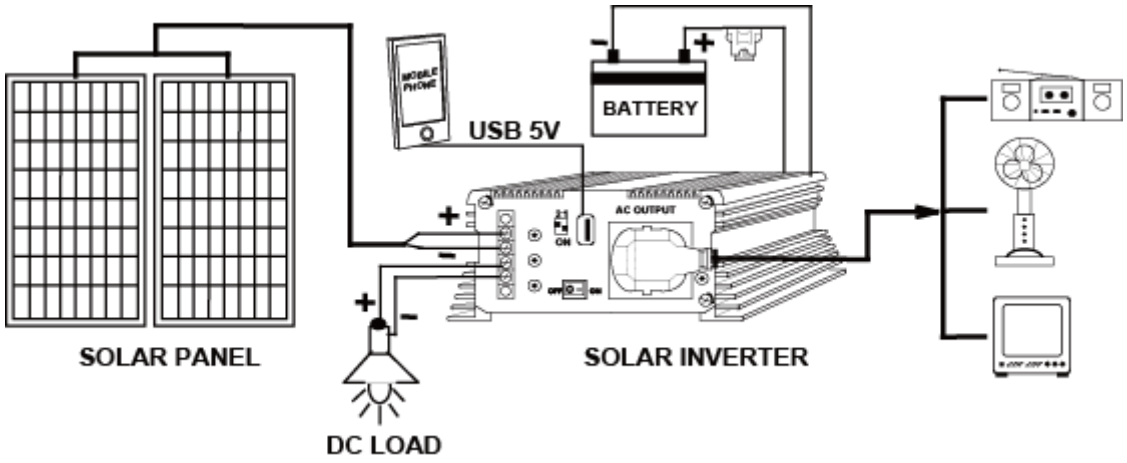


※WARNING※ FLUORESCENT LAMP
Do not use this device with fluorescent lamps.



3.2 Connections

CAUTION: Do not reverse the polarity of DC side. (+) of SOLAR PANEL and BATTERY and DC LOAD should be connected to (+) of terminal as per the printing on the inverter. The (-) should be connected to the (-) terminal.

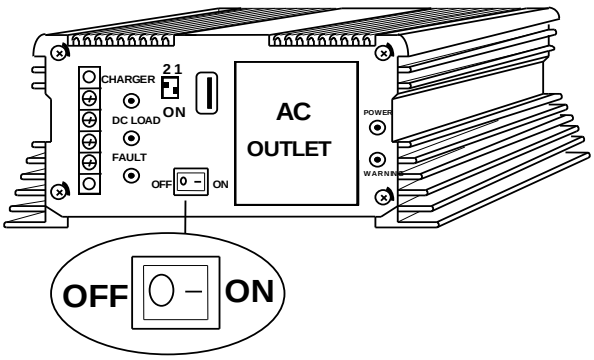


NOTE: Do not run DC load and AC load at same time, as it is easy to miscalculate the total load value and overload the inverter.

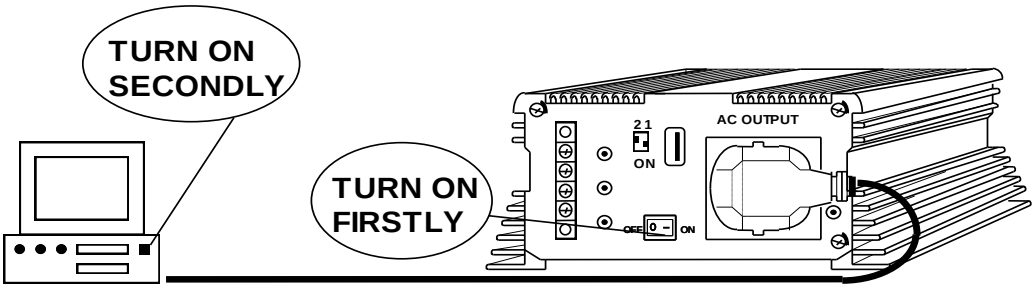
4 OPERATION

4.1 Turning ON power

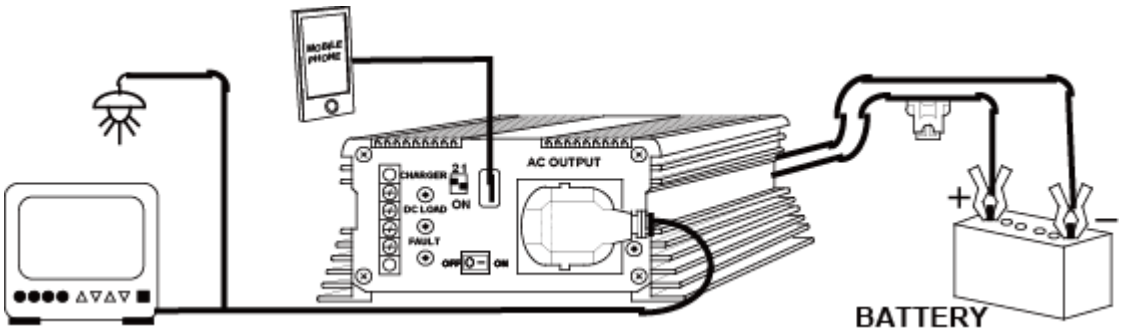
Step 1:
Set the power switch at OFF position.



Step 2:
When connecting appliances, be sure to turn ON the inverter first. Then, turn ON the power switch of the appliance.

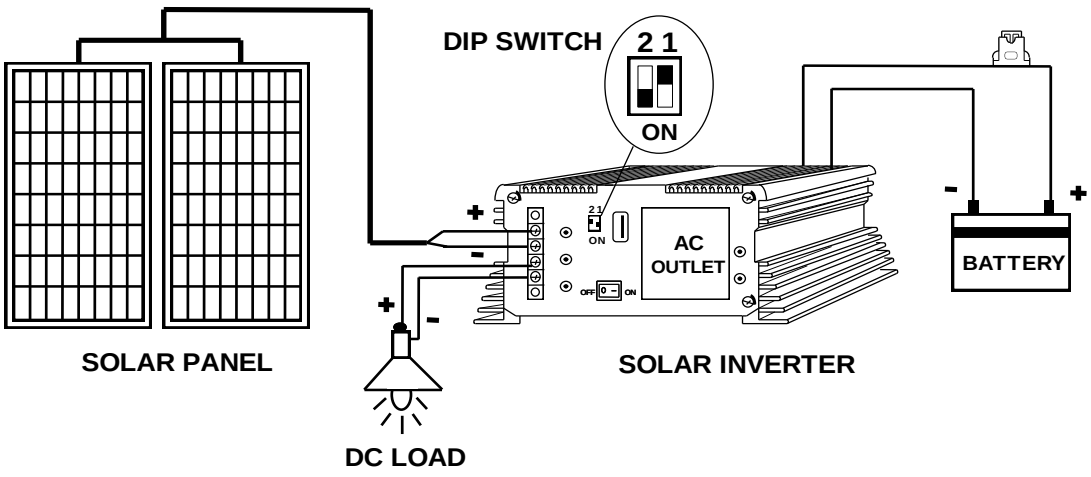


Do not overload the inverter. When connecting appliances, make sure the total starting power capacity does not exceed the maximum output staring power of the inverter.



4.2 Charging the battery

Do not reverse the polarity of DC side. Please set the DIP switch correctly according to the battery type. The DC load connected must not exceed the power rating of the inverter.

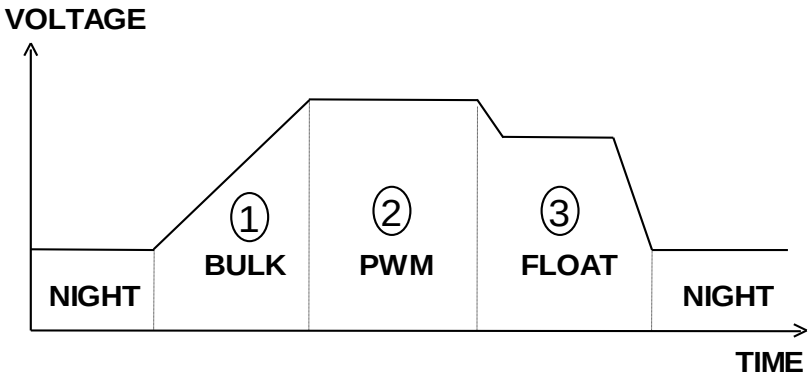


NOTE: Do not run DC load and AC load at same time, as it is easy to miscalculate the total load value and overload the inverter.

DIP switch settings for different battery types:

DIP switch	2	1	Bulk	Float	Battery Type
	OFF	OFF	15V	14.5V	NI-CAD
	ON	OFF	14V	13.8V	GLE / AGM
	OFF	ON	14V	13.5V	Flooded
	ON	ON	14V	13.2V	Sealed / Wet

Solar charging stages:



5 STATUS MONITORING

5.1 Alarms

Inverter warning signal:
Battery Low pre-alarm: bi---------bi---------bi
Overheat pre-alarm: bi---bi---bi---bi---bi
Overload pre-alarm: bi-bi-bi-bi-bi-bi-bi

6 APPENDIX

6.1 Inverter Specifications

Model			SP300-Junior	SP600-Junior
CAPACITY	**Watt**		**300W**	**600W**
INPUT	Voltage range (DC)	12Vdc mode	10 ~ 15Vdc	
		24Vdc mode	20 ~ 30Vdc	
	Current at full load	12Vdc mode	30A	60A
		24Vdc mode	15A	30A
	Current in standby mode	12Vdc mode	< 0.5A	< 0.6A
		24Vdc mode	< 0.4A	< 0.4A
OUTPUT	Voltage range (AC)		220 ~ 240Vac	
	Output wave form		Modified sine wave	
	Frequency		50 / 60Hz	
	Continuous output power		300W	600W
	Peak output power		900W	1500W
EFFICIENCY	Inverter efficiency		85 ~ 90%	
BATTERY	Battery Low pre-alarm	12Vdc mode	10.5Vdc ±0.5V	
		24Vdc mode	21.0Vdc ±0.5V	
	Battery Low shutdown	12Vdc mode	10.0Vdc ±0.5V	
		24Vdc mode	20.0Vdc ±0.5V	
PROTECTION	Thermal protection		60˚C ±5˚C	
	Auto-operating fan		Temperature or load dependent	
	Overload protection		CPU controlled	
	Output short circuit protection		CPU controlled	
	Battery 12/24V mismatch protection		CPU controlled	
	Battery reversed polarity connection protection		By fuse	
	Fuse	12Vdc mode	35A ×1	25A ×3
		24Vdc mode	20A ×1	15A ×3

6.2 Solar Charger Controller Specifications

Model		SP300-Junior	SP600-Junior
Standby Current		< 30mA	
Charger Current		20A	
Max Solar Array Voc		50V	
Max Solar Array Current		20A	
Charging Stage		PWM → Float	
Max Load Current		20A	
Low Voltage Protection	12Vdc mode	10V ±0.5V	
	24Vdc mode	20V ±1.0V	
Low Voltage Reset	12Vdc mode	12.5V ±0.5V	
	24Vdc mode	25V ±1.0V	
Overload Protection		120% of rated current	
Efficiency		> 90%	

6.3 Mechanical Specifications

Model		SP300-Junior	SP600-Junior
Dimensions	L×W×H	200×173×65 mm	280×173×65 mm
Weight	Net weight	1.6 kg	2.8 kg